Research Methods in Biology - BISC 300, Fall 2014
Meeting time: MWF 11-11:50
George Peabody (PSY) Room 202

Dr. Clifford A. Ochs
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"Nature answers only when she is questioned." Jacob Henle

Broad Objectives: BISC 300 broadly examines research approaches used in the biological sciences and in medical research. We will explore the various ways that scientific knowledge is obtained and defined, philosophical issues and methodological approaches related to hypothesis formation, research design, and evaluation of data, the peer-review process, organization of scientific papers, and ethical issues faced by scientists.

Learning Objectives
After completing this course, a student should:

- understand the logic and general procedures of scientific method as used in biology
- understand basics of research design, as used in observation, experimentation, and modeling
- understand and be able to discuss ethical issues faced by scientists in conducting research
- understand and be able to describe the structure of a scientific paper
- understand the peer-review process

Reading:
Supplementary reading materials may include papers, commentaries, and essays. They will be made available on an occasional basis through Blackboard.

Evaluation

Four semester exams	80% (20% each)
Final comprehensive exam	20%

Exam Make-Up Policy: If you know you are to be absent for an exam, or have any problem in taking the exam at the designated time, contact me as soon as possible. If you miss an exam, it is your responsibility to contact me immediately. An exam may be taken at a time other than that designated only with my permission. Decisions are made on a case-by-case basis.

Grading

A	92.5-100%	C	69.5-77.45
A-	89.5-92.45%	D	59.5-69.45%
B+	87.5-89.45%	F	<59.5%
B	82.5-87.45		
B-	79.5-82.45		
C+	77.5-79.45		

Schedule of Topics - Fall 2014

Week	Class Topics, Tests, Assignments
1	Introduction to Research "Ways of knowing"
2	The PEL model of scientific investigation Test 1 - Friday, Sept. 12
3	Overview of "Scientific Methods" Journals, and organization of a Scientific Paper
4	Scientific habits of mind
5	Hypotheses – good and bad
6	Observational, Descriptive studies Test 2 - Friday, Oct. 3
7	Observational, Descriptive studies
8	Observational, Descriptive studies
9	Experimental Methods Test 3 - Friday, Oct. 24
10	Experimental Methods
11	Experimental Methods
12	Modeling studies – Why use models? Test 4 - Friday, Nov. 14
13	Peer Review
14	Research Ethics
FINAL	Final exam - 12 noon, Monday, Dec 8

Other Notes and Policies

1. *Special Needs*. Students with special needs (e.g. physical handicaps or learning disabilities) who need to make special arrangements should consult the instructor within the first two weeks of the semester.
2. *Challenges to Assigned Grades*. Challenges to assigned grades will be welcomed in writing. A written format provides you the opportunity to present an articulate and well-considered argument. Challenges must be submitted within one week of a graded assignment.
3. *Academic Integrity*. Any form of misconduct – cheating, plagiarism, fabrication – will not be tolerated and will subject violators to a failing grade in the course. I do encourage students to collaborate in studying and to review each other's written assignments, but all work turned in for a grade must be completed only by the student submitting the work.
4. *Incompletes*. Incompletes will not be given except in extreme circumstances beyond a student's control.
5. ***Withdrawals*. The last date for withdrawal, no refund, is Sept 9, 2014 (no refunds after Aug 26)**

This syllabus is subject to change at the discretion of the instructor to accommodate instructional and/or student needs.